

WHAT IS CLAIMED IS:

- 1 1. A printed circuit board for use in an electronic device package
2 comprising:

3 a substrate layer comprising impregnated glass fibers;

4 a non-conductive layer comprising a dielectric material free of continuous
5 glass fibers applied to said substrate layer; and

6 an electrically conductive circuitry comprising a conductive material
7 formed on said non-conductive layer such that said non-conductive layer lies between said
8 substrate layer and said conductive material to prevent shorts therebetween caused by
9 migration of said conductive material along said glass fibers.
- 1 2. The printed circuit board as recited in claim 1 further comprising a
2 plated through hole extending through said substrate layer and said non-conductive layer
3 and electrically coupled to said circuitry.
- 1 3. The printed circuit board as recited in claim 1 wherein said
2 dielectric material comprises a photoimageable dielectric material.
- 1 4. The printed circuit board as recited in claim 1 wherein said
2 dielectric material comprises polyimide.
- 1 5. The printed circuit board as recited in claim 1 wherein said
2 dielectric material comprises Kevlar-based paper impregnated with epoxy resin.
- 1 6. The printed circuit board as recited in claim 1 wherein said
2 dielectric material is resin-coated copper foil.
- 1 7. The printed circuit board as recited in claim 1 wherein said
2 substrate layer is prepreg comprising a glass fabric impregnated with epoxy resin.

1 8. The printed circuit board as recited in claim 1, further comprising at
2 least one clearance filled with said dielectric material.

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1 9. An electronic device package comprising:
2 at least one substrate, said substrate comprising impregnated glass fibers;
3 an electronic device coupled to said substrate;
4 a non-conductive layer comprising a dielectric material free of continuous
5 glass fibers applied to said substrate; and A
6 electrically conductive circuitry comprising a conductive material formed
7 on said non-conductive layer or formed on said substrate such that said non-conductive
8 layer lies between said substrate and said conductive material to prevent shorts
9 therebetween caused by migration of said conducting material along said glass fibers.

1 10. The electronic device package as recited in claim 9 further
2 comprising at least one power plane.

1 11. The electronic device package as recited in claim 10 further
2 including a second non-conductive layer positioned between said circuitry and said power
3 plane.

1 12. The electronic device package as recited in claim 10 further
2 comprising at least one plated through hole extending through each said substrate and
3 each said non-conductive layer.

1 13. The electronic device package as recited in claim 12 wherein said
2 non-conductive layer is positioned between said through hole and said power plane to
3 prevent a short therebetween caused by migration of said conductive material along said
4 glass fibers.

1 14. The electronic device package as recited in claim 12 wherein said
2 non-conductive layer is positioned between said through hole and said circuitry.

1 15. The electronic device package as recited in claim 9, further
2 comprising at least one clearance filled with said dielectric material.

1 16. The electronic device package as recited in claim 9 wherein said
2 electronic device is electrically coupled to said circuitry.

1 17. The electronic device package as recited in claim 9 wherein said
2 circuitry includes a plurality of solder pads.

1 18. The electronic device package as recited in claim 17 further
2 comprising a solder ball coupled to one of said solder pads.

1 19. The electronic device package as recited in claim 9 wherein said
2 dielectric material comprises a photoimageable dielectric material.

1 20. The electronic device package as recited in claim 9 wherein said
2 dielectric material comprises polyimide.

1 21. The electronic device package as recited in claim 9 wherein said
2 dielectric material comprises Kevlar-based paper impregnated with epoxy resin.

1 22. The electronic device package as recited in claim 9 wherein said
2 dielectric material comprises resin-coated copper foil.

1 23. The electronic package device as recited in claim 9 wherein said
2 substrate layer is prepreg comprising glass fabric impregnated with epoxy resin.

1 ✓ 24. An electronic device package comprising:

2 a non-conductive substrate comprising a dielectric material free of
3 continuous glass fibers;

4 an electronic device coupled to said substrate; and

5 electrically conductive circuitry comprising a conductive material formed
6 on said substrate wherein said electronic device is electrically coupled to said circuitry.

1 25. The electronic device package as recited in claim 24 further
2 comprising at least one power plane laminated to said substrate such that said dielectric
3 material lies between said circuitry and said plane.

1 26. The electronic device package as recited in claim 24 further
2 comprising at least one plated through hole extending through said substrate.

1 27. The electronic device package as recited in claim 24 wherein said
2 circuitry includes a plurality of solder pads.

1 28. The electronic device package as recited in claim 27 further
2 comprising a solder ball coupled to one of said solder pads.

1 29. The electronic device package as recited in claim 24 further
2 comprising a prepreg comprising a glass fabric laminated to said substrate.

1 30. The electronic device package as recited in claim 24 further
2 comprising at least one clearance filled with said dielectric material.

1 31. An electronic device package comprising:

2 / at least one substrate, said substrate comprising impregnated glass fibers;

3 at least one plated through hole extending through each said substrate;

4 at least one conductive power plane;

5 an electronic device coupled to said substrate; and

6 a non-conductive layer comprising a dielectric material free of continuous
7 glass fibers positioned between each said plated through hole and each said power plane to
8 prevent a short therebetween caused by migration of said conductive material along said
9 glass fibers.

1 32. The electronic device package as recited in claim 31 further
2 including additional non-conductive layers is positioned between said substrates and said
3 power planes.

1 33. The electronic device package as recited in claim 31 further
2 comprising electrically conductive circuitry comprising conductive material formed on the
3 surface of said substrate.

1 34. The electronic device package as recited in claim 32 wherein non-
2 conductive layers are positioned between said circuitry and said power planes.

1 35. The electronic device package as recited in claim 32 further
2 comprising at least one clearance filled with said dielectric material.

1 36. A printed circuit board for use in an electronic device package
2 comprising:

3 a substrate layer comprising impregnated glass fibers;

4 a non-conductive layer comprising a dielectric material free of continuous
5 glass fibers applied to said substrate layer; and

6 an electrically conductive circuitry comprising a conductive material:

7 (a) formed on said non-conductive layer, and

8 (b) encapsulated by said non-conductive layer

9 such that said non-conductive layer lies between said substrate layer and
10 said conductive material to prevent shorts therebetween caused by
11 migration of said conductive material along said glass fibers.

1 37. A printed circuit board as recited in claim 1 wherein the thickness
2 of said non-conductive layer is between 0.5 mils and 5 mils.

1 38. An electronic device ~~package~~ as recited in claim 9 wherein the
2 thickness of said non-conductive layer is between 0.5 mils and 5 mils.

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1 39. An electronic device package as recited in claim 24 wherein the
2 thickness of said non-conductive substrate is between 0.5 mils and 5 mils.

1 40. An electronic device package as recited in claim 31 wherein the
2 thickness of said non-conductive layer is between 0.5 mils and 5 mils.

1 41. An electronic device package as recited in claim 36 wherein the
2 thickness of said non-conductive layer is between 0.5 mils and 5 mils.

1 42. A method of forming an electronic device package comprising the
2 steps of:
3 providing a glass fibers substrate;
4 impregnating said substrate with a resin;
5 thereafter applying a discrete layer of dielectric material free of glass fibers
6 over said impregnated substrate;
7 applying a layer of electrically conductive circuitry over said discrete layer
8 of dielectric material; and
9 coupling an electronic device to said electrically conductive circuitry.

1 43. A method of forming a printed circuit board comprising the steps
2 of: /
3 providing a glass fibers substrate;
4 impregnating said substrate with a resin;
5 thereafter applying a discrete layer of dielectric material free of glass fibers
6 over said impregnated substrate; and

7 applying a layer of electrically conductive circuitry over said discrete layer
8 of dielectric material.

1 44. The method as recited in claim 42 wherein said discrete layer of
2 dielectric material free of glass fibers is applied to a thickness of between 0.5 mils and 5
3 mils.

1 45. The method as recited in claim 43 wherein said discrete layer of
2 dielectric material free of glass fibers is applied to a thickness of between 0.5 mils and 5
3 mils.

1 46. An electronic device package comprising:
2 ✓ a glass fibers substrate impregnated with a resin;
3 a discrete layer of dielectric material free of glass fibers over said
4 impregnated substrate;
5 a layer of electrically conductive circuitry over said discrete layer of
6 dielectric material; and
7 an electronic device package coupled to said electrically conductive
8 circuitry.

1 47. An electronic device package as recited in claim 46 wherein the
2 thickness of said discrete layer of dielectric material free of glass fibers is between 0.5 mils
3 and 5 mils.